Farmers' Gazette,

AND CHERAW ADVERTISER.

VOLUME VI. CHERAW, SOUTH-CAROLINA, WEDNESDAY, APRIL 7, 1841. NUMBER 21.

By M. MAC LEAN.

TERMS:—Published weekly at *three dollars* a year; with an addition, when not paid within three months, of twenty per cent per annum.

Two new subscribers may take the paper at five dollars in advance; and ten at twenty.

Four subscribers, not receiving their papers in town, may pay a year's subscription with ten dollars, in advance.

A year's subscription always due in advance.

Papers not discontinued to *solvent* subscribers in arrears.

Advertisements not exceeding 16 lines inserted or one dollar the first time, and fifty cents each subsequent time. For insertions at intervals of two weeks 75 cents after the first, and a dollar if the intervals are longer. Payment due in advance for advertisements. When the number of insertions is not marked on the copy, the advertisement will be inserted, and charged till ordered out.

☞ The postage must be paid on letters to the editor on the business of the office.

AGRICULTURAL.

PRIZE ESSAY.

[To the following was awarded the prize offered by the publisher of the "*American Farmer*" for the best Essay on the subject on which it treats—the prize consists of *a complete set of the American Farmer* (15 *vols.*) *the five volumes of the Farmer and Gardener, and two volumes of the American Farmer new series*—the subscription price of which is $100.

ESSAY.

ON THE RENOVATION OF THE SOIL, DETERIORATED BY IMPROVIDENT CULTURE.

By Dr. William L. Horton,

Of Woodlawn, near Abingdon, Harford Co. Md.

Agriculture, while it is one of the most healthy occupations, is at the same time one of the most respectable and independent. No situation in life can be conceived more happy than that of the educated farmer, who owns the soil he cultivates, who is out of debt, and who has the means of improving his lands and keeping his estate in good order.

The pleasure experienced by the farmer in seeing the trees and plants of his care flourish, is not to be known nor described to those who are inexperienced in rural economy. Each object possessing vegetable life, that has been nurtured and reared by his attention, seems almost like a part of his family. If the inanimate part of creation can afford him so much pleasure, how much greater must be his delight in witnessing the contented countenances of his bleating flocks and lowing herds!

The intelligent and prudent husbandman does not permit the soil he owns and cultivates to be deteriorated by over cropping; but by a judicious rotation of crops, and renovating applications, so manages his land, that it is always kept in a progressive state of improvement until it arrives at a *maximum*, or such a state of fertility that there is no need of further melioration.

On the other hand, the ignorant and reckless farmer, by exhausting crops, by taking *all from*, and returning *nothing to* the soil, soon finds it so much exhausted that it becomes inadequate to his support: and in despair he abadons it by turning it out for "old field," millions of acres of which may be noticed from Maryland to Georgia, both inclusive. He is then driven to one of two alternatives; either to sell his miserable worn out acres and migrate westward, or clear up a new farm on his own domain; to do either is generally inconvenient and unpleasant. For a man advanced in years, to be under the necessity of experiencing the toils and hardships incident to clearing up a new farm, at a time when he should be enjoying the *otium cum dignitate*, appears to be reversing the established order of nature. Equally unpleasant, nay, revolting must it be to the sensitive mind, to be driven from the home of his childhood, from the place of his nativity and early associations, from friends and connections, into that which is little better than banishment—the western wilderness—where he is compelled to associate with the most vulgar and uncongenial spirits; the outcasts, in many instances, of European jails and work houses.

It is to avoid such a catastrophe that we are called upon to exercise our skill and industry, in renovating the lost powers, and resuscitating the dormant energies of the exhausted soil. The subject would afford a wide scope for amplification, for fanciful speculation and fine-spun theoretical reasoning: but we propose to treat it in a plain practical manner, rather in a concise than diffuse style, addressed to the common sense and practical experience of the agricultultural community, rather than to the vivid and erring fancy of visionary theorists.

As this essay may be read in different parts of the United States, it may not be improper here to observe, that its practical details will be more particularly adapted to the middle States.

Without any learned or artificial division of the subject, we propose to treat it under several distinct heads, which will be noticed as we progress in our labour; and that which appears to us to claim priority is—

Of the artificial division of the Farm.

Every farm, whether large or small, whether the soil be of good or bad utility, should be divided into *at least* six fields, for the arable land; in addition to which, if there be any land fit for a permanent meadow it may form a seventh field; and it would be well to have three lots of about one acre each, near the barn or dwelling house. There should generally be kept, two in grass for calf pasture, &c. —the other to be tilled, in rotation, in potatoes and other roots and vines. But as we anticipate objections to this division on account of the quantity of fencing required, it is proper that we say something

Of the materials for Fencing.

Chesnut and cedar, for rails, answer the best purpose, and will commonly last about one hundred years, if they be kept from the ground, and if the bushes and briars be not permitted to grow up by their side. That which is commonly called *worm* fence is thought to answer the best purpose for outside fences; for division there are several choices. *Post and rail*, the posts made of locust, cedar or chesnut, answers a good purpose.—*Stone fence* may do *when distant from the buildings*; but it always serves as a harbour for rats and other predatory animals; yet when the materials are at hand it is a good way of using them on account of their durability. The foundation should be laid below frost.

Hedge fence, when constructed of *thorn*, is too slow of growth; that on the Orange farm, near Baltimore, has, to the knowledge of the writer, been planted more than twenty-five years; and it cannot at this time be considered as a perfectly safe barrier against hogs and cattle. The proprietor has erected *at least two* new fences by its side for its protection in that time; the writer thinks three. Among the several substitutes that have been mentioned for them there is none that appears to us so appropriate as the *Morus Multicaulis*. It is quick of growth, tenacious of life, may be propagated to an unlimited extent by *layers;* and may be so wattled and interwoven as to form an insuperable barrier, in a few years, to all ordinary animals. Besides, silk-worms may be fed on its foliage, a circumstance of no small importance; sheep and cattle will browse on its straggling branches, and thus obviate the use of shears to keep it trimmed. As to the objection of its being too tender to withstand the effects of frost, it is all ideal; for we have left a nursery of these trees out during the past winter, and scarcely a bud has perished. They are to be planted in a hedge this spring, and it is intended to plant these trees by the side of all our division fences, that by the time the fences are decayed we may have a *living* fence, which shall answer the three-fold purpose above-mentioned. From the knowledge the writer has of this tree he is of opinion that a good fence may be made of it in four or five years.

Of Manures.

Manures are of three kinds, vegetable, animal and mineral. As this is the most important part of our subject we shall give it a full and fair consideration; but we shall be very careful how we advance any thing which has not come within our own observation and experience.

1st. *Vegetable Manures*—These are numerous; but probably the greatest source of supply is the barn-yard and stable. Several plans have been proposed for the construction of a barn-yard; the best of which is, to let it be a little *dishing* —say from two to three feet, according to size. If the soil be loose or sandy it should be lined with clay to prevent the loss of urine and the soluble part of the manure. This yard is to be well supplied every fall with vegetable matter of some kind for the two-fold purpose of affording the cattle comfortable beds, and to retain the liquid parts of the manure from escaping. *Leaves* from the adjoining forests answer an excellent purpose; cornstalks and weeds, and for want of something better, bark that has been used by tanners will answer; sea ware, sea weed, or sea grass is excellent for manure. It will of course be proper to prevent the water from the adjoining lands or buildings from running through the barn-yard, as it would carry off much of the valuable part of the manure. In favor of leaves as a manure may be mentioned the fact that they are the principal supply, afforded by nature to the soil of forests, for their support, and that notwithstanding the immense growth of wood and timber such lands produce and sustain, they are by this small annual supply not only kept from impoverishment, but in most cases they are in a progressive state of improvement. What a lesson is to be derived hence by the reflecting farmer! Protection from heat and drying winds, with a small annual return to the soil, are all that are requisite to produce large crops without impoverishment to the soil.

The prudent husbandman will provide racks, if not shelter, for his cattle, from which they may eat their hay, straw &c. That which they drop or leave may serve to increase the dung-heap.

Husks of the Vicini Bean, from which oil has been expressed, may be put, a handful in each hill of corn to great advantage. *Cotton Seed*, bruised, will answer the same purpose.

The refuse left on the hearths of coal pits, when spread pretty thick, has been found to act beneficially in two or three ways. First, as a stimulus and permanent manure by the ashes it contains, the decomposition being slow, and thus affording to the soil a supply of carbon, the great food of plants. Secondly, by a mechanical action, on clayey soils, in opening them and making them repvious to moisture. Tairdly, in such soils as are of a *cold* nature, by the color given to them, they receive and retain more solar heat.

2. *Animal Manures*, are such as are composed of substances purely animal, among which are *Fish*. On the Chesapeake and Potomac, on Long Island, and in other places herrings and other fish have been used to some considerable extent as a manure. The best way to apply them is to plough them under as soon as they are spread, that the soil may absorb the volatile parts which would otherwise be dissipated in the air. In this way they will cause about two good crops, when their substance will be chiefly spent.—The practice of catching fish with the object of using them for manure is reprehensible, while there are so many beings in the world who would be glad to get them as food; but we have never known them caught for this express purpose.* They are mostly *offal* from large fishing establishments that are used for manure.

Pickle which is left from curing fish, mixed with ashes or lime, makes an excellent manure.

Blood and Garbage from butchers' shops. Near cities these may be obtained in large quantities, and are well worthy the attention of the husbandman who wishes to improve his soil and raise large crops.

Scrapings of currying shops and tan yards, cannot often be obtained in large quantities; but are worthy of notice.

Ground bones—Mills have been erected for the purpose of reducing bones to powder; and in this way they are used to a great extent for manure; but they are not lasting in their effects; a few bushels to the acre are said to produce one large crop. Lastly, under this head, we mention

The refuse from tallow chandlers, sometimes called *greaves*. This is similar in its effects to that obtained from the butchers, and may be used advantageously in the hill for corn.

From what we have said on *vegetable and animal manures*, the inference will be drawn that they are not lasting in their effects; and that to derive benefit from them long they must be applied often.—We are then to seek further and look for something more desirable in its nature that shall, by proper culture, impart to the soil permanent fertility.

3. *Mineral Manures*—These are such as are taken directly from earth, and are either calcareous or saline; and at the head of them stands that invaluable, that efficient and precious article,

LIME. Of all the blessings bestowed on the husbandman by the beneficent hand of an all-wise Creator, next to pure water, perhaps should be placed *Lime*.—It has been well observed that those substances most essential to the life of man, have by the goodness of divine providence been distributed in the greatest abundance, and over the greatest extent of the globe. This is certainly the case with water, which covers a great portion of it, and without which man could not long exist. So with lime, which forms whole chains of mountains, is a component part of all soils, is a constituent part of most grain, and enters essentially into the formation of man, as well as the lower grade of animals. So far as chemical science has developed the resources of nature, *lime* is believed to be the only article that can give *permanent* fertility to soils; and from the most accurate experiments that have been made, on very fertile soils, they have been found to contain at least one-tenth part of lime. In a soil containing the other essential ingredients of silex, alumine and vegetable matter in due proportion, with one-tenth lime, as above stated, nothing can be easier, on the part of the good husbandman, than to keep it in a state of fertility any given length of time.

This is the only substance that can be obtained by agriculturists, generally, in such quantities and at such prices as will admit of its use as a manure, for a restoration of the soil. It may be applied in various ways; but that which has been found best is to spread it on a grass sod, soon after it is slacked, and while in a state of *fine powder*. This part of the process is more essential than at a first view may occur to casual observers. If the lime be permitted to get so wet, after being slacked, as to form lumps, it will do but little good, as will appear more plain from what we shall say presently. The lime should, as a general rule, be spread in the fall that it may lay through the winter to be dissolved by the *cold* rains; lime possessing the singular property, perhaps different from any other substance, of being dissolved more readily in cold than in warm water.

It requires, I think, about 600 pounds of *cold* water to dissolve one pound of lime; hence the impropriety of putting a large quantity on the soil at once, as a considerable portion would in that case by absorbing carbonic acid from the atmosphere, become what it was before it was burnt—lime stone, or a carbonate of lime.

The quantity proper for different soils must of course vary from 50 to 150 or even 200 bushels; but I would recommend the application of but 50 bushels at once, which quantity may be repeated until the requiste fertility is obtained. Let it be observed that I speak of *unslacked* lime, when I mention these quantities.

It would not be proper to attempt to lime more than one field a year, and but few can accomplish that, if the field be large; in this way the profits, derivable from liming, will, after the first year, nearly cover the expenses; or at any rate they will greatly assist in the operation.

Let no one however be too sanguine of great and immediate profits; they will come somewhat slow, but sure. In some instances the advantages of liming have been made in such an almost imperceptible manner that farmers have been discouraged. Generally, however, those who have used lime are pleased, and regret that they have not the means of doing it more extensively.

Lime, like all other alkaline manures, should be kept some time on the surface, for the purpose above mentioned,—that it may be dissolved, and that the soil may become saturated with the ley. It should not be wet and lumpy when spread, or it will not be dissolved; but become a carbonate, and do but little good. It never loses any thing by evaporation, and in that respect it is unlike the two former kinds of manure, which we have noticed.

Some eight or ten years ago, a Mr. Nelson, of this county, commenced liming his land at an expense of twenty dollars per acre. He was one of the first, perhaps the very first, and his neighbors thought he was crazy. They found, however, in a few years, when a field of twenty acres produced four hundred barrels of corn—that is 2,000 bushels of shelled corn—that there was "method in his madness."

As it regards the *price* at which a farmer can afford to use lime as a manure, it must be regulated by the price of wheat. According to my estimate, a bushel of wheat should pay for five or six bushels of lime delivered on the farm.

It may be expected that we should offer our views as to the *modus operandi* of lime; this part of the subject we approach with some diffidence, and without any pretension to freedom from error; but as we have embarked on the troublesome ocean of philosophical speculation, we may, as well as our compeers, hazard a conjecture, leaving it to our readers to judge of its accuracy.

Lime cannot long remain in the soil as a clax, calcium, or quick lime; but by its attraction of carbonic acid from the atmosphere, it becomes a carbonate. In this primary action of absorbing carbonic acid' a portion is at the same time taken up by the plant. But why, it may be asked, is lime so durable in its effects upon the soil? That lime has the effect of loosening a heavy, clayey soil is a point conceded by all who have used it on such soils. I do not believe, with professor Ducatel and some other chemists, that the oxalic, or any other *free* acid exists to any considerable extent in any soil; lime then is *not* necessary to neutralize an *acid* in the soil. Calcium, or quick lime is more readily dissolved than the carbonate; and as almost all plants, and particularly wheat and oats, contain a portion of lime they may receive it as a part of their necessary food in this way. Carbonate of lime, or lime stone, requires a much larger quantity of water to dissolve it, nevertheless it is while in the soil always undergoing a slow decomposition, and is thus taken up by the plant.

It is admitted by all who have used lime on such soils, that it renders clayey ones lighter and sandy soils more compact. The experiments of the writer have been on a soil of the first description—argillaceous—and before he used lime he had great trouble in pulverising it. Land that was limed five or six years ago is at this time quite sufficiently pulverulent and friable.

How does lime produce this effect? Is it merely such a mechanical division as is effected on clay with sand, or is it something different?

Certain bodies, although they may not enter into chemical union, attract each other—repulsion is a property of other bodies. Let us take quicksilver for instance. The ultimate particles of this metal have an attraction for each other, as may be observed when violence is used to seperate them, they form into innumerable sphericles, or globules. With some substances it will enter into chemical union—with others it will form no such compound. We never see, nor hear of, a *carbonate* of quicksilver. It will *mix* with some metals as an amalgam. Tin, lead, silver, gold, are of this class; but it will not mix with iron. There is such a powerful repulsion existing between turpentine and this metal, that the more you attempt to unite them the more the metal flies into a million parts and utterly refuses an admixture until it is reduced to an impalpable powder or oxide. Honey of the same consistence will not have any such effect.

Lime has a metalic base—calcium—and Orfelia says that clay or argil has also —alluminum—others deny this to clay; but it does not destroy our hypothesis which is this;—that lime and clay are two distinct heterogenous bodies; and that so far from having a chemical affinity, or attraction for each other, they are decidedly repellent, and that in attempting to mix them they not only refuse to come in contact, but fly asunder like the balls of an electrometer—or the dust from sealing wax excited by electricity.

If it be said that the division is mechanical, and such as would be effected by sand, wo deny the assertion, and can prove to the contrary in two ways. 1st. We say that the same quantity of sand will not have the same effect on clay. 2d. That a *solution* of lime will cause clay to become friable. Then beside the natural food which lime affords to plants it loosens the stiff clayey soils, and renders them permeable to their roots in search of their necessary aliment.

If it be true, as is asserted by many, that lime renders sandy soils more cohesive, it follows as a corollary of what has been said concerning lime and clay, that the other two are more homogeneous in their nature; that a kind of adhesive attraction exists betweeen them, thus rendering such soils more retentive of moisture.

These are merely speculative opinions of the writer which may not be new to others; they are so however to him. He attaches no great importance to them; yet thinks them quite as reasonable as some others that have been propagated on higher authority.

We shall probably elucidate the action of lime more fully when we come to speak of gypsum or sulphate of lime.

Ashes after they have been used by the soap boilers, commonly called spent ashes. Although ashes, strictly, are a *vegetable* manure, yet on account of the similiarity of principle and mode of action we have thought proper to arrange them with the mineral manures. The essential salt of ashes is well known in commerce under the name of potash. It is the vegetable alkali, and bears in its properties, a strong resemblance to the mineral alkali or soda.

Like lime, this manure losses nothing by evaporation; but its tendency is to sink. One hundred bushels of these to the acre, serve as an excellent dressing for wheat, and will last five or six years. Ashes are prompt in their action, and are therefore by some preferred to lime. It is probable that more advantage is to be derived from using the two together than from using either separately.

For corn a compound of three parts ashes and one part plaster, a handful put in each hill, is found to answer an excellent purpose.

Barbilla is a name applied to a very impure carbonate of soda, imported, from the East Indies, and used by the soap boilers. To get it freed from the quantity of carbonic acid it contains they are obliged to mix with it about one-third of lime. The compound, after the alkali is extracted, is sold under the name of *Barbilla ashes*. They are sold about two cents a bushels less than the *black ashes*, but are not worth half as much. They have been used to some extent as manure.

Nitrate of Soda is said to exist in large quantities in Atacama in Peru, South America, whence it is imported. It may be obtained for about three dollars a hundred pounds, and probably could be obtained for less in large quantities, as it is said to be very abundant in the earth over a large district. Its effects on grass, about one hundred pounds to the acre, are said to be good. From the appearance and nature of the article I am inclined to the opinion that it may be used to some extent as a renovator of worn out soils.

Sulphate, of lime gypsum, selenite or plaster of paris—Next to lime this is the most important article among mineral manures. This salt is found in large beds or layers in different parts of the globe and particularly at Montmartre, near Paris, and at Nova Scotia, on this continent. That which is used as manure is not by any means a pure sulphate of lime, for it contains a large quantity of carbonic acid; it is therefore a *mixture* of calcareous sulphate and calcareous carbonate. The coloring matter is either from vegetables or iron. The properties of this salt are but little understood and not properly estimated. That so small a quantity as one bushel, or a little over one hundred pounds by weight, should when strewed over an acre of clover produce such surprising effects as to increase the crop two-fold is beyond common comprehension. But its effects are not confined to clover, although its use is nearly so. It has been tried in various species of vegetables with equally good effects.—The great error in using it is by putting on too small quantities. Another error is in putting it invariably *on* the surface instead of *in* the hill. The writer, last year, tried it on potatoes in the hill, with surprising advantage. The crop, with the exception of two rows was planted in the usual way, with a liberal supply of manure in the hill. Those two rows had no manure applied, but were planted by strewing plaster or gypsum on them pretty freely before they were covered with earth. They received the same kind of culture, and when they were dug in the fall were fully equal in size, weight and flavor to those planted with manure. These were Irish potatoes; but there is not a doubt that gypsum would be found equally beneficial on sweet potatoes. On corn and most garden vegetables it has been used in the same way with decided and unequivocal benefit. The corn crop of the writer was last year dressed *on* the hill, soon after it was planted with lime and plaster—three parts of the former to one of the latter—with very good effects. He will, this year, put it *in* the hill.

The quantity used to each hill was not more than half a gill—perhaps a little more would answer a better purpose. We have been informed by an intelligent farmer in an adjoining county, that he a few years ago, strewed gypsum over his field of corn, broadcast, about one bushel to the acre, with surprising advantage to the crop.

In Lancaster and York counties, Penn., it is a very common practice to strew gypsum over the wheat in the spring, say about the 1st April. We have never tried this, but intend to do so in a few days. It may be a proper, however, to mention an objection which has some weight. A great deal of wheat in this section of country is injured, while it is soft and in a milky state, by *rust*. Gypsum is said to have the effect of keeping the wheat green, and thus of retarding its ripening in due time. The later the harvest the more danger of rust as it is thought.

When we examine into the *cause* of what is called *rust*, we are compelled to admit that there is some considerable force in the argument. Rust in wheat occurs only in very wet seasons, with very warm close weather and fogs. The disease is occasioned by a bursting of the sap vessels, from repletion of moisture. This (the sap) exudes and dries on the stalk in form of a scale; indeed the straw is covered with a powder in some degree resembling the rust of iron hence the name. The consequence is that the supply of sap is cut off from the grain while in the milk, and it perishes.

But whether the premises from which these conclusions are drawn be not erroneous admits of investigation; and as this can be best made by actual experiment, we shall make it the present season. Our farm is very small and may be considered as an experimental one; but small as it is we find we can make more *clear* than our neighbours who possess large farms of poor half cultivated fields. We have two lots of wheat of the same kind, white bearded winter wheat. (*triticum turgidum conicum album aristiferum*) of about the same size and quality; we shall sow both with clover, and on one we will strew one bushel of gypsum to the acre; the result may be communicated hereafter to the public for whose good our labors have been principally directed, as well in husbandry as professionally, all our life.

All seed grain should be washed or soaked before being sown or planted. The great advantage of washing seed wheat can only be known to those who have tried it. A large quantity of light wheat, chess, garlic and other filth may thus be removed. No farmer should sow impure seed; he had better pay double price for that which is clean. Seed corn, and indeed nearly all seeds would be the better for being soaked and rolled in plaster before being sown or planted. Lime would answer nearly the same purpose, but it might be injurious to the hands. Brine, or pickle, moderately strong, should be used for washing wheat; as it is more buoyant and causes a greater number of worthless grains to swim on its surface. The benefit of rolling seed grain in gypsum will be apparent by the healthy and vigorous shoot which will be sent forth in the germinating process.

As we have ventured to advance our opinions on the *modus operandi* of lime, so we will again expose ourself to the shafts of criticism by offering our views on the action of gypsum. It is, at the most superficial glance, evident that some agents are concerned in the product, occasioned by the application of this salt to vegetables, beside the material itself. One bushel of gypsum applied to an acre of clover shall make a difference in the product equal to ten times the weight of the material applied. Whence comes this additional weight? *Is* it from the soil or atmosphere, or both? It is admitted by chemists that this salt undergoes very little alteration by the action of air, and that it is dissolved by about 500 times its weight of water. We have before observed that the plaster used for agricultural purposes is not a pure sulphate of lime, but that it is a mixture, &c. Now as this mixture is perfectly mild and bland, insipid and inodorous, and can never be dissolved in less than 500 times its weight of water, it forms an application wonderfully adapted to the growth of plants, and we may very readily conceive how an extraordinary increase of growth may be produced, without supposing a decomposition and new combinations necessary.

That pulverised gypsum has the power of absorbing moisture from the atmosphere has been proved by actual experiment.—A certain quantity by weight, having been exposed a few days, shortly after having been ground, has been found by absorption to have increased to some extent; but not sufficiently to account for the phenomena noticed in its productive powers. The mild solution of gypsum is a peculiarly fit food for plants; as by its stimulant property it enables the plant more fully to develope itself, and draw such other supports to its aid as may be present in the soil or atmosphere.

From observing the surprising effects of gypsum in promoting the growth of vegetables, philosophers have racked their brains to account for it in a rational manner. That its principal action was by ab-

* An exception may be mentioned in the large flat sea-fish called *skate*, which is unfit for food; they have been caught expressly for manure on the Eastern Shore of Maryland.